

# CANADIAN AGRICULTURAL ENGINEERING

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The Journal of the Canadian Society of Agricultural Engineering  
La Revue de la Société Canadienne du Génie Rural

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## YESTERDAY, TODAY AND TOMORROW

C.G.E. DOWNING

Past President CSAE and AIC Fellow

I very sincerely appreciate President Don Clark's invitation to write a guest article for the Journal as I take leave to the other side of the world to another great country of the Commonwealth, Australia, starting a new career, although in essence it is really returning to an old one. Also, having been Editor of the Journal during its first nine years of struggle in publication, I am pleased to note that many of the guidelines and principles established during that time are still being followed and certainly compliment subsequent editorial committees and reviewers on the recognition and credibility that the Journal now enjoys.

Agricultural engineering in Canada has come a long way in the more than 40 years since I entered the field as a student, under the ever-to-be-remembered tutelage of the late Professor Evan A. Hardy at the University of Saskatchewan in Saskatoon. Inestimable credit goes to the early pioneers who developed the work and lived it through their lives — Evan Hardy, Lawsen Shanks, J. McGregor-Smith, Grant Denike, Ray Frey in the West and Louis Hiempel, John Evans and Angus Banting in the East. I was ushered into the scene along with John Parker, Don Horne, Ed Hudek and Jim Beamish, the first President of the Society, J. Arnold Roberts and Bill Kalbfleish, during the Great Depression and the "Dirty Thirties" in the West. During this period, agricultural engineering in many forms rose to the occasion and, with agronomists and soil specialists, saved the Prairie West to continue as Canada's breadbasket, not only for itself, but for others around the world in need of food. The concepts of our present day mulch-minimum tillage energy conservation practices were born and new types of equipment appeared on the market. This decade also saw the introduction of the self-propelled combine and rubber tires for tractors; advanced mechanization has been rolling ever since.

However, this period was followed by the "Wartime Forties" which slowed down developments, as other responsibilities had greater priorities for men and machines. The end of this period paved the way for the "Developmental Fifties" in which a great many agricultural engineering activities were expanded and new ones got under way. Educational programs moved rapidly and today we have seven fully accredited agricultural engineering programs and 75 university staff members in the field. Extension activities opened up in all areas and have made real contributions in the technology transfer to the farmers, with today at least 90 provincial engineers contributing their efforts in this way. Research activities started to expand and today it is estimated that there are more than 75 man-years in university, government and industry associated with this work.

The Canada Farm Building Plan Service was initiated in this era and farm buildings started to take on a new look across the horizon. Drainage and irrigation took on the hydrology concept and water resource utilization became the "in" thing. Farms became fully electrified, and farmstead mechanization was on the move.

This busy period heralded in the "Rebellious Sixties" when social, cultural and ethical patterns started to change. This not only caused turmoil of a new type, but started all people thinking more broadly and at the same time in greater depth in order to ensure that their foundations were strong and sure. This period was indeed the preface to the "Crises Seventies" as Rachel Carson's "Silent Spring" and great cries of "save our land and our wildlife" established the environmental crises, and the Club of Rome introduced the world to world strategies for resources, people, food and pollution. The Arabs then caused us to recognize the greater potential crises in the escalating energy consumption and the rapid depletion of these resources. Now energy evaluation takes over in basic concepts from economic evaluation of our everyday activities. Oh for the joy of just one more gasoline war! Before this decade runs out, we are sure to have a water crisis in many parts of the world, and although there has been a food crisis in many countries almost from the beginning of time, it will soon be taking on world proportions.

In reflection, agricultural engineering has been involved in all of these activities and certainly must play an even more important role in similar activities into the future. The CSAE has shown significant growth and stature during its almost 20 years of existence. The records will show that it actually started exhibiting some rebellion in the Sixties against its status as an Affiliated Society in the structure of the Agricultural Institute of Canada. I was thrilled to read recently of the restructuring of the AIC and to recognize that it has finally matured and come of age placing professionalism and technology in their proper perspective in a learned society. I was personally disappointed that we did not rise to the occasion a few years ago and become a constituent society of the Engineering Institute of Canada and thus have really been the bridge between these two great professions. However, I guess one must have some disappointments in order to really appreciate the joy of contributions and success.

I extend my best wishes for continued success of the CSAE in an expanding role and express sincere appreciation for having been a member and president of the Society as well as having been able to play some small part in agricultural engineering in Canada to date. Finally, thanks to the CSAE for sponsoring me for a Fellowship in the AIC. This is indeed a real honor.

*Canadian Agricultural Engineering* publishes papers covering the general field of Agricultural Engineering that fit into one of the following classifications: 1) a scientific paper based on original research; 2) a technical paper based on design, development, testing, or analysis of machines, equipment, structures, processes, or practice; 3) a general paper on education relative to curricula and philosophy or trends in science, on a survey or investigation of some phase of research or research methods, or on extension or extension methods. The Editorial Board may also publish abstracts of papers published elsewhere and interesting news items of members of Agricultural Engineering.

Manuscripts for publication should be submitted to the Chairman of the Editorial Board. The papers must be original and must not have been published elsewhere or copyrighted. The author, not the CSAE, is responsible for opinions expressed. Information published in *Canadian Agricultural Engineering* may be quoted in whole or in part provided that credit is given to the author and to the journal. Information on page, reprint, and other charges may be obtained from members of the Board.

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## OBITUARY



The death of Donald E. Clark Associate Professor and Head of the Agricultural Engineering Department at the Nova Scotia Agricultural College is a loss to his family, the College and agricultural engineering not only in Nova Scotia but across Canada. Don passed away in his sleep following a heart attack on Friday, 8 April 1977 and was buried at Bridgeville, Pictou County, Nova Scotia.

Donald Clark had come a long way in his lifetime being born in Luchow, China in 1923 where his parents were missionaries. When his father died his mother and sister Jean who still live in Ontario, returned to Canada with Donald, then only 15 months old.

His interest in agriculture and machinery developed at an early age on his uncle's farm and continued while he worked at Massey Harris, Toronto. A period of four years in the RCAF working on aero-engines did not distract him from agriculture, and he enrolled at the Ontario Agricultural College from which he graduated with an honours BSA, in 1951. Following a year with Massey Ferguson in production control he returned to O.A.C. in 1952 to teach in the School of Agricultural Engineering until 1968. During this time he obtained an M.S.A. in Agricultural Engineering (1962) and became an Associate Professor teaching courses in farm machinery and mechanization.

In 1968 Don left, but did not forget, his friends in Guelph and moved with his family to Truro to be an Associate Professor and Head of the Agricultural Engineering Department of the Nova Scotia Agricultural College. In this post which he held until his death he taught farm machinery, horticultural machinery and agricultural mechanization and helped develop the agricultural engineering department to include a technician course in farm equipment, short courses for farmers, an initial two-year degree course for agricultural engineers, and establish a summer research program.

Don's special interest for which he was renowned, was in sprayers and zero tillage for corn production and this was reflected in his research work, publications and the committees of which he

was a member. Among these numerous committees were the Canada Weed Committee, the Atlantic Herbicide Committee and the Atlantic Agricultural Engineering Committee. He was also Chairman of the Sub Committee on Crop Protection Equipment of the Canadian Advisory Committee to the Standards Council of Canada. His publications were the fruition of his work and have appeared in journals, government publications and society proceedings since 1965. Chemical tillage for corn, field sprayers, spray nozzles and equipment and minimum tillage being some of the many subjects on which he wrote both as an individual and with other authors.

A member of a number of Professional Societies related to his agricultural engineering and special interests, Don was a Professional Engineer and Agrologist. He was a Charter member and President of the Canadian Society of Agricultural Engineering, being elected in July 1976. Other memberships included the American Society of Agricultural Engineers, the Agricultural Pesticide Society, the Nova Scotia Institute of Agrologists, the Association of Professional Engineers of Nova Scotia, the Agricultural Institute of Canada, and the Engineering Institute of Canada.

His interests extended beyond his work and professional associations, to the church and musical associations to which he brought the same devotion and enthusiasm that he had for his daily work.

Don is survived by his wife, Barbara, his son, David a pharmacist in Halifax and his daughter, Mary Beth who is studying in Toronto.

Donald Clark in a comparatively short life achieved a great deal and yet retained attention to detail. His work will be carried on by his students and remembered by his many friends throughout Canada. His lesson to us all should be that the time we have available is not important, what we do in that time is, and how well it is done is of concern to ourselves and others.



# NOTES TO CONTRIBUTORS

The Editorial Board will assess suitability and essential detail of papers submitted for publication in *Canadian Agricultural Engineering*. One or more reviewers will be used. Their comments and suggestions will be compiled and submitted to the author. The review will ensure that:

1. A research paper does represent a piece of research carried to a well-defined stage of advancement and that the conclusions are adequately supported by the experimental results.
2. A technical paper represents a clear, concise, and factual outline and interpretation of the development, design, test, or analysis under consideration and that it is a contribution in the field of agricultural engineering.
3. A general paper on education, research, or extension is pertinent to major changes in curricular, research, or extension or to forward-looking developments in these areas.
4. A technical note, of one journal page or less, on equipment development, technique of measurement, or method of analysis will have application for other workers in the field of agricultural engineering.

## MANUSCRIPT

The manuscript should be typed double-spaced on paper 8-1/2 x 11 inches (21.6 x 27.9 cm) with margins not less than 1-1/4 inches (3.3 cm). The first page should contain only the title, authors' names, addresses (including postal codes), and contribution number where applicable. Tables and captions for illustrations should be on separate pages, placed after the text. Manuscript paper with numbered lines is preferred. The original and two copies are required.

The title of the paper should be capitalized and centered on the page; it should give an accurate description of the article, using key words that can be used for computer-indexing.

## ORGANIZATION

The paper should be organized to conform with present Journal practice. *Research* and *technical* papers must

include a short abstract section of about 200 words.

Major headings – Center on the page with all words in capital letters.

Subheadings – Start at left-hand margin, capitalize first letter of major words.

Sub-subheadings – Start at left-hand margin, in lower case except first letter of first word, and underline.

Technical and detailed information should be included only in the form of description, table, graph, chart, or photograph. In general, follow the *Council of Biological Editors Style Manual*, 3rd ed., published by the American Institute of Biological Sciences, 3900 Wisconsin Avenue, NW, Washington, D.C. 20016.

## References

List references alphabetically by authors at the end. Include year of publication, title in lower case except first letter of first word, and source, with volume and page numbers where applicable. Names of periodicals should be abbreviated in the form given in *BIOSIS List of Serials with Title Abbreviations* (Bioscience Information for Service of Biological Abstracts, 211 Arch Street, Philadelphia, Pa. 19102). Material in press, with the name of the journal, may be used as a reference. Private communications and unpublished reports should be referred to in parentheses in the text. Avoid the use of footnotes where possible. Use the author-date system in the manuscript when referring to articles in the Reference section.

## Tables

Designate tables at the top by table number (Roman numerals) and title, all in capital letters. All headings and other information in tables are to be in lower case except first letter of first word. Keep the table compact and place it across the page wherever possible. Do not use vertical lines.

## Measurements

Use the metric system (SI) in the text. Equivalent English units may be given in parentheses. Tables, charts and graphs should be given only in metric units.

## Equations

Equations and formulas must be set up clearly. Use capitals for symbols as much as possible and lower case for superscripts and subscripts. Greek and other characters should be identified clearly. Equations should be numbered on the right-hand margin in large numbers and in line with the center of the equation.

## Abbreviations

For commonly used terms, consult the *CBE Style Manual*. Abbreviate units of measures only when used with numerals. Do not use abbreviations in the title. Normally, numbers less than 10 should be spelled out, e.g. six.

## Paragraphs

If paragraphs are to be numbered, designate by arabic numerals. Designate sub-paragraphs by lower case letters in parentheses.

## ILLUSTRATIONS

An illustration or a group of them should be planned to fit, after reduction, into a space equal in width to that occupied on the journal page by one column (preferred) or two or three columns if necessary. The original should not be more than three times the size of the final reproduction. For identification, the figure number, author's name, and paper title should be written lightly in the lower left corner of a photograph. Use a soft lead pencil. Photographs should be printed on glossy paper with strong contrasts approximately 5 x 7 inches (12.7 x 17.8 cm) in size. *One set is required for each copy of the paper.*

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Make line drawings in india ink on plain or blue-lined paper or other suitable material. Letters, numerals, labels and axis captions should be made in capital size with a lettering guide (*not a typewriter*). They should be large enough that the smallest character will not be less than 1 mm high when reduced. Type the figure numbers and captions on a separate page. *One set of clear copies is required with each copy of the paper. The original drawings must be provided when the paper is accepted for printing.*